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SOURCE      Newspapers and periodical as indicated.

# A NEW THEORY OF CELLS AND NONCELLULAR FORMS OF LIFE

[Numbers in parentheses refer to appended sources.]

In the No 16 (August 1950) issue of Bol'shevik, an article entitled "On Noncellular Forms of Life and the Development of Cells" is published by N. N. Zhukov-Verezhnikov, I. Mayskiy, and Kalinichenko

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The article discusses primarily Professor O. B. Lepeshinskaya's theory and also goes rather extensively into Bosh'yan's new theory of viruses. It mentions the discussion of Lepeshinskaya's theory which took place at a special meeting held on 22 - 26 May, 1950, under the auspices of the Department of Biological Sciences, Academy of Sciences. USSR, and refers to resolutions praising Lepeshinskaya's work which were passed in June 1950 by the Presidium of the Academy of Sciences USSR and the Presidium of the Academy of Medical Sciences USSR. According to Vestnik Akademii Nauk SSSR (1), the text of the resolution passed by the Presidium of the Academy of Sciences USSR is as follows:

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1. It is recommended that all biological and chemical institutions of the Academy of Sciences USSR concentrate on problems of noncellular forms of life and the development of cells, and in connection with extensive work in this field carry on a merciless fight with all outmoded remnants of Virchow's teaching in the corresponding subdivisions of biology.
2. The Department of Biological Sciences, in setting up plans for scientific work to be done in 1951 and within the scope of the 1951-55 Five-Year Plan, should make adequate provisions for work in this field.
3. The Ministry of Higher Education USSR and the Ministry of Public Health USSR are requested to review programs of study and texts in general biology, histology, cytology, biological chemistry, microbiology, pathological physiology, and pathological anatomy with the view toward eradicating the remnants of idealistic concepts on the nature of the cell and for the purpose of introducing correct ideas into the branches of science which are concerned with the nature of the cell.

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4. The All-Union Society for the Dissemination of Political and Scientific Knowledge should be requested to take appropriate measures for the dissemination of Lepeshinskaya's ideas on the origin of the cell and for the initiation of organized criticism directed against idealistic tendencies in the field of cell science.

5. The Presidium of the Academy of Medical Sciences USSR should be requested to consider the question of expanding the work directed by Lepeshinskaya at the Laboratory of Cytology of the Institute of Experimental Biology, Academy of Medical Sciences USSR.

6. The publishing house of the Academy of Sciences USSR should be entrusted with the publication of scientific monographs, collections of articles, and popular scientific literature dealing with questions pertaining to noncellular forms of life and connected with criticism of Virchow's ideas.

7. It is suggested to editorial boards of biological periodicals published by the Academy of Sciences USSR that criticism be directed against adherents of Virchow's ideas in specific fields of biological science.

8. The material presented in the course of the discussion held at the initiative of the Department of Biological Sciences is to be published in the form of a separate volume. The following have been appointed editors of this volume: Academicians A. I. Oparin who wrote a report on the discussion which formed a basis for the Presidium's resolution (see source 3) and N. N. Anichkov; N. N. Zhukov-Verezhnikov, Active Member of the Academy of Medical Sciences USSR, and Professors I. Ye. Glushchenko and G. K. Khrushchev.

On the occasion of the award of the Stalin Prize First Class conferred on Professor O. B. Lepeshinskaya, Doctor of Biological Sciences, by a special decision of the Soviet government, A. Aleksandrov, in Meditsinskiy Rabotnik (2) reviewed Lepeshinskaya's activity since 1933. He described the perfected microscopic techniques used by Lepeshinskaya and referred to visual observation of the formation and gradual development of cells in noncellular egg yolk carried out through a mica window inserted into the shell of an egg which was being incubated. He further mentions Lepeshinskaya's work on fresh-water hydras, in the course of which the formation and growth of cells in cell-free juice obtained by masceration of the plants was established. According to these observations, states Aleksandrov, the minute colorless particles of protein which are formed initially in the juice develop into cells when transferred into a nutritive medium. This takes place over the intermediary stage of spheres. The cells subsequently divide, forming full-fledged hydras.

It was further established, according to Aleksandrov's account, that the process of cell formation from noncellular tissue rather than by the division of cells is not limited to primitive organisms like the hydra, but also occurs in higher mammals during the healing of wounds. Aleksandrov then goes on to review the debate between Pasteur and Poucher on the subject of spontaneous generation, mentions Poucher's success in cultivating microorganisms from allegedly sterile hay, cites Engels (who criticized Pasteur), and berates the bourgeois French academicians who supported Pasteur in an entirely unjustified manner without giving his opponents a chance. Later on, however, Aleksandrov objects to statements made by Lepeshinskaya's critics to the effect that she postulates generation of life from nonorganic matter. In other words, Aleksandrov apparently distinguishes between nonliving matter and living protein which, while devoid of cells, is capable of generating them.

In his article, Aleksandrov mentions the new edition of Lepeshinskaya's book The Formation of Cells from Living Matter and the Role of Living Matter in the Organism.

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In the report to the Presidium mentioned above (3), A. I. Oparin points out the possibility of the formation of structures resembling living cells, and states that Lepeshinskaya established that the cells newly formed from noncellular protein are actually alive and capable of reproduction. The animal organism, according to Oparin's account, consists of 30-40% noncellular matter which is, nevertheless, alive. During the five discussions which took place under the auspices of the Department of Biological Sciences of the Academy of Sciences USSR on 22 - 26 May 1950, and in which 140 people, including 26 speakers, participated, Lepeshinskaya presented exhaustive proof of her premises, Oparin states. This proof, according to Oparin, is supported by numerous biological preparations. Lepeshinskaya demonstrated that the cells formed from noncellular protein have the metabolism of living cells and that they divide and propagate in an entirely normal manner. The meeting called by the Department of Biological Sciences, Oparin continues, recommended that Lepeshinskaya's ideas be popularized and that they be applied extensively in medicine and agriculture.

The commentaries which accompany the official announcement of the resolution passed by the Presidium of the Academy of Sciences USSR (1) point out that Lepeshinskaya's work opens new perspectives for the creation [stanovleniye] of qualitatively new forms of life both in the course of phylogenesis and ontogenesis, thus developing, in complete accordance with Michurin's teaching, biological modifications which are of the greatest use to the human race.

## SOURCES

1. Vestnik Akademii Nauk SSSR, Vol XX, No 7, Jul 1950, pp 131-132.
2. A. Aleksandrov, "Sources of the Living," Medit'sinskiy Rabotnik, Vol XIII, No 39 (903), 28 Sep 1950, p 3
3. A. I. Oparin, "On Noncellular Forms of Life and the Development of Cells" (Report on the Results of the Discussion Held at the Division of Biological Sciences, Academy of Sciences USSR), Vestnik Akademii Nauk SSSR, Vol XX, No 7, Jul 1950, pp 119-222.

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